

the days named, by an orbit, the elements of which Dr. Oppölzer gives as follows:—

Epoch 1850, January 1^o, Paris M.T.

Mean anomaly	356 0	
Longitude of perihelion	27 45	} Equinox of 1850.
" " ascending node	178 0	
Inclination to ecliptic	7 0	
Angle of excentricity	14 13 or $e = 0.2456$	
Log. semi-axis major	9.0906	
Mean diurnal motion	22.789529	

The period of revolution would therefore be 15.7797 days. Comparing with the observations employed the following are the differences shown by the above orbit in geocentric longitude; the calculated geocentric latitude is annexed:—

	Diff. longitude.	Latitude.
1800, March 29, Fritsch	+ 0.6	+ 14
1802, Oct. 10, "	+ 0.4	- 14
1819, Oct. 9, Stark	+ 0.2	- 13
1839, Oct. 2, Decuppis	+ 0.5	- 7
1849, March 12, Sidebotham	- 0.8	- 7
1857, Sept. 12, Ohrt	+ 0.1	+ 7
1859, March 26, Lescarbault	0.0	+ 10
1862, March 20, Lummis	+ 0.1	+ 2

But it is unfortunate that notwithstanding this almost perfect representation of the longitudes assumed and the circumstance that the latitudes point to a transit across the sun's disk on every date, there are apparently fatal objections to our admitting the existence of a planet with these elements, several of which are pointed out by Dr. Oppölzer. It may be sufficient to mention here the first of them:—With so short a period and small inclination, a transit across the sun's disk would occur every year, and we know that observation by no means supports such a condition. However, the existence of a body moving in this orbit will admit, as Dr. Oppölzer states, of very early decision:—On March 18 a nearly central transit should occur—

Ingress at 18 8 Berlin M.T. ...	Angle of position 74
Egress at 23 15 " ...	" 254

We give these particulars as affording another illustration of the difficulties attending any trustworthy inferences from the observations of suspicious spots upon the sun's disk. The above orbit, it should be mentioned, will not accord with either of Prof. Watson's presumed planets, though possibly, by increasing the excentricity, elements might be found which would agree with one or other of his positions, while representing most of the observations used by Dr. Oppölzer. We ignore the idea of a want of *bona fides* on the part of the observers on so many occasions, but there is still to be remembered the fact that comets have traversed the sun's disk, and with small perihelion distances might do so without our discovering them except in the course of transit, supposing them to possess the degree of condensation which some have indicated. The object observed by M. Coumbary at Constantinople in May, 1865, could only have been a comet, with a perihelion distance so small as, like the great comet of 1843, almost to graze the sun's surface.

GEOGRAPHICAL NOTES

AT the meeting of the Geographical Society on Monday, when the Earl of Dufferin occupied the presidential chair for the second and last time, Mr. T. J. Comber, of the Baptist Missionary Society, who is about to lead an expedition above the Yellala Falls of the Congo, gave some account of his explorations inland from Mount Cameroons, in the course of which he visited a district of country previously unknown, and discovered a small lake to the northward of the mountain; he also ascertained that there was a broad valley there instead of a continuous

mountain range. He mentioned one fact with regard to Mount Cameroons, which goes far to show that there may be some difficulty in finding a suitable spot for the proposed missionary sanatorium. When at an elevation of 2,000 feet there were such heavy mists, that, although he slept between two fires, his blanket was wet through. It is, of course, possible that here, as in the Neilgherry Hills, and other places, positions may be found to which the miasmatic influences do not extend. Mr. Comber next gave some brief and interesting notes of a journey which he made through Congo to Makuta, the place which Lieut. Grandy saw from the brow of a neighbouring hill, but was not allowed to enter. Sir Henry Barkly afterwards read some observations on the Bamangwata country in South Africa, to which a melancholy interest attached from the fact of their having been drawn up by the late Capt. R. R. Patterson, who recently met with his death by poison when some three days' journey from the Victoria Falls of the Zambesi. The country would appear to be of a not very promising nature, for its soil is sand, covered with stunted bush, and there are few mountain fastnesses, except those near Shoshong, the capital; in the winter it is badly watered, as the Limpopo, Zambesi, and Zouga (or lake river), are the only rivers which run continuously, while the Tati, Shasha, and Makalapogo, are sand rivers. The open country is sparsely inhabited by Veld-people of two classes, the Bakala and Masarwa, of whom the former enjoy the right of possessing cattle and gardens, but the latter neither; they are, in fact, slaves, living on game and roots. The Bamangwata country is ruled by a chief named Khame, whom Capt. Patterson described as a very good man, an opinion in which Sir H. Barkly concurred.

IN connection with the meeting on Monday at Preston in reference to a Central African railway, the letter in yesterday's *Times* from the Alexandria correspondent of that paper is of interest. It seems that the Khedive had some time ago devised an excellent scheme for bringing the riches of the great lake district to the outer world by way of the Indian Ocean, at the mouth of the Juba river. The distance between that point and Victoria Nyanza is only 280 miles, and McKillop Pasha was instructed to work gradually from the coast, planting colonial stations at regular distances, while Gordon Pasha was to co-operate from the lake side. Though the plan seems to have been ably, but too secretly devised by the Khedive, it rather unfortunately fell through, we think on account of the jealousy of the Sultan of Zanzibar and his friends. There is no talk by the Khedive of a railway, and we think with the *Times* correspondent, that something more elementary should be attempted, with a country so totally undeveloped as that of Africa. That it will be opened to trade soon by some nation is evident. English, Germans, Italians, French, Portuguese, are all striving from various points. There is plenty of room for all.

A LARGE amount of material for arriving at some approximately correct notion of the mean depth of the sea, has accumulated in recent years. In a note to the Göttingen Academy, Dr. Krümmel has lately attempted this, in view of the vague and variable statements on the subject in text-books. Soundings were wanting for the Antarctic and a part of the North Polar Sea, *i.e.*, about 475,000 square miles, or 7 per cent. of the entire sea-surface, so that he gives his estimate only as a closer approximation. He estimates, then, the mean depth of the sea as 1,877 fathoms, or 3,432 metres, or 0.4624 geographical miles. It was natural to compare the mean height of dry land above the sea-level. Humboldt's estimate of 308 metres is regarded as quite out of date. Leipoldt has since estimated the mean height of Europe as 300 metres. Accepting this number for Europe, 500 for Asia and Africa, 330 for America, and 250 for

Australia, Dr. Krümmel obtains the mean of 420 metres, or 0.0566 miles. The surface-ratio of land to water being considered 1:2.75, the volume of all dry land above the sea-level is inferred to be 140,086 cubic miles, and the volume of the sea 3,138,000 cubic miles. Thus the ratio of the volumes of land and water is 1:22.4. That is, the continents, so far as they are above the sea-level, might be contained 22.4 times over in the sea-basin. Reckoning, however, the mass of solid land from the level of the sea-bottom, the former would be contained only 2.443 times in the sea-space. Dr. Krümmel also compares the masses (taking recent data); he finds that of the sea 3,229,700 cubic miles, and that of the solid land 3,211,310 (a small difference). If the specific gravity of the land were raised merely from 2.5 to 2.51432, we should thus have perfect equilibrium. Such equilibrium is probably the fact.

NEWS has been received from Moscow that Colonel Grodekoff, of the Russian general staff, has returned to that place from a somewhat venturesome expedition in Central Asia, during which he travelled in European clothes, and without any attempt at disguise. He was accompanied by a Kirghiz and two Persians, and traversed the northern part of Afghanistan, reaching Persia by way of Herat.

IN connection with the Russian scheme for a railway from Orenburg to Tashkent, it is stated that the Grand Duke Nicholas is preparing a third expedition for 1879, which is to set out in the end of March. After having passed Tashkent and Samarkand, it will cross the Amu and pursue its researches to the defile of Bamian, in Afghanistan, in the direction of Kabul. The explorers will then descend the Amu in a native boat, from the meridian of Balkh to Khiva, for the purpose of investigating the navigation of that river. From Khiva they will follow the ancient bed of the river to its old mouth in the Caspian.

CAPT. HOWGATE has presented to the United States Congress a supplementary note on the advantages arising from the creation of a polar colony on the border of the great palæocrystic ocean. The whaling interest is fast on the decrease in the States; the total value of imports being only two million dollars instead of ten millions twenty years ago. This deficit has been attributed by Agassiz and other competent authorities to the whales taking refuge in that almost inaccessible polar basin, to which, by the creation of a civilised station at Lady Franklin Bay, access might be gained.

THE Conference on the civilisation of Africa held a meeting recently at Brussels under the presidency of the King of the Belgians. It is stated that Mr. Stanley, who was present, "will be placed at the head of the approaching Belgian Exploring Expedition to Africa."

PETERMANN'S *Mittheilungen* for February contains a detailed account, with map, of Dr. Woeikoff's travels through central and southern Japan in 1878. In connection with a narrative of the discovery of the island Einsamkeit to the north-east of Novaya Zemlya is a map of the island showing its configuration and relative position. Prof. Hann contributes a short paper on the climate at the Victoria Nyanza on the basis of data collected by Dr. Emin Bey and the Rev. Mr. Wilson.

THE January number of the *Bolletino* of the Italian Geographical Society contains a long letter from Lieut. Bove, who accompanies Nordenskjöld's expedition; it was written from the mouth of the Lena, and gives many important details of observations made up to that point.

THE December *Bulletin* of the Paris Geographical Society contains a valuable sketch of the work done in Sumatra by the Dutch expedition, which started in the beginning of 1877 under the late M. Santwoort, and of which we have from time to time given news. The sketch is by Col. Venteggio. The number contains also the addresses by M. Huber in presenting the medals for

1878 to Mr. Stanley, M. Vivien de St. Martin, and Dr. Harmand.

A YOUNG Austrian painter, Herr Joseph Ladein, of Mödling near Vienna, has recently started for a tour through Central Africa. In a letter dated from Oran he states that his intention is to proceed through Marocco, to cross the Great Desert to the Senegal River, then to turn eastward to Haussa and the Nile Lakes, and to return to Europe along the course of the Nile.

A BRANCH of the new Berlin "Society for Commercial Geography and the furtherance of German Interests Abroad" has been established at Leipzig.

M. L. BABÉ has announced to the Paris Geographical Society that he proposes to explore the globe by means of an improved Montgolfier balloon, capable of storing heat in all regions and of maintaining a sufficient height for several weeks.

BAD news has been received from Zanzibar by the French Geographical Society. It appears that two of the French missionaries who were exploring this part of Africa have died, one of them by illness, and the other having been killed by a lion.

NOTES

AT a full meeting of the Council of the Zoological Society, held on the 5th inst. at the Society's office, in Hanover Square, Prof. William Henry Flower, F.R.S., Conservator of the Museum of the Royal College of Surgeons, was unanimously elected president of the Society, in succession to the late Marquis of Tweeddale. The new president, who, we need hardly inform the readers of *NATURE*, is one of the most learned zoologists and anatomists of the present day, has been for some years on the Council of the Society and one of its vice-presidents, and has communicated many valuable memoirs to its *Transactions* and *Proceedings*. Prof. Flower is the seventh president elected since the foundation of the Society in 1826. Sir Stamford Raffles, the first president, who died a few months after the foundation of the Society, was succeeded by the Marquis of Lansdowne, who resigned in February, 1831, in favour of the thirteenth Earl of Derby, then Lord Stanley. He held the presidentship for upwards of twenty years, and on his death, in 1851, was succeeded by the late Prince Consort. On the death of the Prince Consort, in 1861, Sir George Clerk, of Penicuik, was chosen as his successor, and retained the presidentship until his death, in 1867. He was succeeded in January, 1868, by the late Lord Tweeddale, then Viscount Walden, whose death has caused the vacancy to which Prof. Flower has succeeded.

THE Chemical Society have received from the executors of the late Mr. Sydney Ellis a legacy of 1,000*l.* free of duty.

THE friends of Prof. Clifford, who has been compelled by ill health to relinquish active work and reside in Madeira, are anxious to present him with a substantial testimonial in public recognition of his great scientific and literary attainments. At a meeting held at the Royal Institution, Albemarle Street, on Friday, January 31, Dr. William Spottiswoode, President of the Royal Society, in the chair, it was resolved that a fund should be raised for the above-mentioned purpose, and that the sums received should be placed in the hands of trustees, for the benefit of Prof. Clifford and his family. Contributions may be paid to the account of the "Clifford Testimonial Fund," with Messrs. Roberts, Lubbock, and Co., or to either of the Honorary Secretaries. Among the gentlemen who have kindly consented to act on the General Committee are the following:—Dr. William Spottiswoode, Dr. Andrew Clark, Prof. R. B. Clifton, F.R.S., Prof. T. H. Huxley, Prof. Henry Morley, Prof. A. Newton, F.R.S., Sir Fred. Pollock, Bart., Prof. Roscoe, F.R.S., Prof. H. J. S. Smith, F.R.S., Hon. Mr. Justice Stephen, Sir Henry